GaN News

# First GaN MMIC

At the Biennial IEEE Cornell University Conference on "Advanced Concepts in High Performance Devices" (Ithaca, NY, USA), Cree Inc (Durham, NC, USA) announced the demonstration of record RF power performance from a GaN HEMT. The GaN HEMT transistor was incorporated into a hybrid amplifier. At a frequency of 10 GHz, pulsed RF output power was 40 W (2.5 times greater than reported for a single device).

Cree has also reported the first GaN MMIC, grown on a semi-insulating SiC substrate. In the first iteration, the GaN MMIC achieved 20 W of pulsed RF output power at 9 GHz, exceeding the highest RF output power GaAs MMICs.

According to Cree's Director of Advanced Devices John Palmour, "The 40 W hybrid amplifier demonstrates the vast improvement in power performance over GaAs, yielded by placing the GaN device on our high thermal conductivity semi-insulating SiC substrates. We believe the first demonstration of a GaN MMIC heralds a new era of high-performance wide-bandgap MMIC-based amplifiers that are expected to outperform other semiconductor technologies for power and bandwidth."

The work at Cree on GaN hybrid and MMIC amplifiers was funded, in part, by the Air Force Research Laboratories and the Office of Naval Research, respectively. Cree is targeting GaN discrete devices and MMICs for 5-35 GHz commercial broadband communications, as well as military radar and communications applications.

**Cree Inc**
**Tel: +1-919-313-5397**
**Fax: +1-919-313-5452**

# LumiLeds forms new Components Business Unit

LumiLeds Lighting (San Jose, CA, USA) has created a new Components Business Unit division to pursue sales of LED die and 'light engine' products (which use multiple high-power AlInGaP and InGaN LEDs fixed to a metal-clad-PCB for "edge-lit" LED signs, designed to replace fluorescent and neon light sources but usable for outdoor daylight applications) but not automotive and traffic signal activities.

- Under a joint marketing venture, Dialight Corp is to offer LumiLeds' high-flux LED-based traffic signals at a 40% price reduction, designed to stimulate conversions from incandescent signals and shorten the payback period on municipalities' initial investment in the signals.

**Dialight Corp**
**Tel: +1-732-223-9400**
**Fax: +1-732-528-1648**

# GaN substrate cuts defects 100-fold

A team of researchers from the Institute of Physical and Chemical Research (Riken, Saitama, Japan) and Hokkaido University, headed by Dr Yoshinobu Aoyagi, has developed a new method of producing GaN substrates for blue-violet lasers.

Compared to the established Epitaxial Lateral Overgrowth method, Aoyagi's method has only three steps (eliminating lithographic pattern of the threading-dislocation-blocking hard mask) so the wafer never leaves the reactor.

Also, after the first layer has been grown, a gas containing impurities is introduced. The impurities cleave to the top of the layer of GaN, filling the cracks and eliminating the defects. Then another layer of GaN is grown on top of the first. Crack density is about 50 x $10^6$/cm$^2$ instead of 5 x $10^9$/cm$^2$. A 100-fold reduction in defects increases the usable portion of each wafer, also cutting production costs.

Aoyagi also claims that the blue-violet lasers last longer.

**Riken**
**Tel: +81-48-462-1111 (ext.3361)**
**Fax: +81-48-462-4659**

# Opto Briefs

**Traffic Technology Inc** (Scottsdale, AZ, USA) is offering to provide its Unilight LED traffic signals free to every city, state and county in the USA in exchange for the money saved on energy costs over the next five years. In tests, Arizona Public Service found TTI's turn arrow signals use 9 W of power whereas a standard incandescent uses 135 W. TTI has plans to take the programme global (Tel: +1-480-607-0033).

**The GELcore LLC** joint venture between General Electric Company and EMCORE Corp (Cleveland, OH, USA) is to acquire **Ecolux Inc** (Montreal, Quebec, Canada), a maker of high-performance LED traffic control signal modules.

GELcore has also launched its first AlInGaP High-Brightness LEDs: red (626 nm) and red-orange (620 nm).

**Vishay Intertechnology Inc** (Malvern, PA, USA) has released a full-colour range of Vishay Telefunken TELUX red, yellow, true-green, blue-green, blue, and white high-intensity LEDs for vehicle brake lights, tail-lights, and turn signals, as well as traffic signs, outdoor message panels, and warning lights.

Luminous flux ranges from 650 mlm for the white TLWW 7600 to 2000 mlm for the red TLWR 7600 at 85°C.